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281.000 FOREST RESOURCE ACRES

in

RALEIGH COUNTY, WEST VIRGINIA

COMMITTEE

DISCUSSION

PRIMARY

PROCESSING

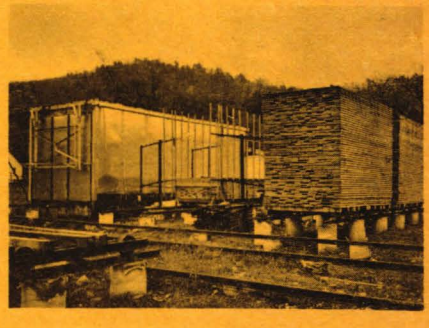
PROPER

PREPARATION

FAMILY TYPE

RECREATION

DESIRABLE



DIMENSION

West Virginia
Department of Resources
Division of Forestry

U. S. Department of Agriculture
Forest Service
Division of State and Private Forestry

281.000

FOREST RESOURCE ACRES

IN

RALEIGH COUNTY, WEST VIRGINIA

1962

WEST VIRGINIA DEPARTMENT OF RESOURCES
DIVISION OF FORESTRY

U. S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
DIVISION OF STATE AND PRIVATE FORESTRY

Foreword

Most land in Raleigh County, West Virginia, is forest land and producing timber which can be converted into consumer goods. It is a source of other values also and well suited for outdoor recreation. It can contribute much more to the welfare of its owners and to the general economy of the region than is now the case.

Recently, the West Virginia Department of Natural Resources and the Forest Service of the U. S. Department of Agriculture completed a study of Raleigh County's forest resources. The study is part of an activity—called Unit Approach To Forest Productivity—initiated in 1960 for the purpose of determining opportunities for further development and use of those resources.

Specific objectives of the study were to determine:

1. Area and volume of merchantable timber available for use.
2. Areas suitable for timber operations and their location.
3. Quality and size of available timber.
4. Types of ownership controlling operable timber stands.
5. Future timber supplies, growth and drain.
6. Adequacy of forest resource activities.
7. Appropriate uses of forest land in addition to timber production and utilization.

This report summarizes the findings and conclusions resulting from the study. It will serve as a guide and source of information for Rural Areas Development Committees, planning units, landowners, and others who are concerned with the use and care of forest resources in Raleigh County.

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SUMMARY AND RECOMMENDATIONS

Raleigh County originally was covered with a fine forest consisting chiefly of white pine, hemlock, yellow poplar, oak, and associated timber species. The white pine was generally conceded to be among the best in all West Virginia.

The first sawmill of size was set up by John Beaty in 1890 who also built the first railroad in the county. Because of difficult logging conditions and long hauls, the timber industry did not expand until completion of the Virginian Railroad and extension of the Chesapeake and Ohio early in the present century.

By 1910 the band mills of Blue Jay Lumber Company, W. M. Ritter Lumber Company and American Column and Lumber Company were in operation as well as circular mills belonging to Harper and Wingrone, A. Daniels, George French and J. B. Earwood. The combined annual output of these mills for several years beginning in 1910 was said to be not less than 60 million board feet.

Uncontrolled forest fires which damaged standing timber and seriously impeded white pine regeneration were common occurrences fifty and more years ago. By 1916, however, landowners and timber operators had organized the Central and Southern West Virginia Fire Protection Associations. Their efforts provided a foundation of organized fire prevention and control. Fire problems still persist in some areas although the general situation is much improved.

Forest products now manufactured in Raleigh County consist largely of hardwood lumber and to a lesser extent of mine timbers. Most of the lumber is shipped to other States in rough condition and there manufactured into finished goods. Mine timbers are used locally.

Current drain on timber resources is materially less than in the peak years of half a century ago. Growth of standing timber is now in excess of drain and can be increased. Thus, raw material is available for expansion of the timber-based industry.

Raleigh County is well suited for several forms of outdoor recreation. Some facilities have already been developed but ample opportunity exists for expansion of this resource.

Recommendations resulting from the study are summarized as follows:

Forest Management and Protection:

1. Provide more technical guidance and advisory service for forest landowners.
2. Include forest landowners on Rural Areas Development Committees.
3. Publicize benefits and advantages of intensive management and protection.
4. Promote multiple-use forest management.
5. Expand timber stand improvement measures and the planting of trees.
6. Intensify fire protection measures and maintain control over destructive forest insects and tree diseases.

Utilization and Marketing of Forest Products:

1. Develop a program designed to improve the quality of lumber manufactured and to improve operating efficiency in all phases of production from the stump to the lumber yard.
2. Emphasize the advantages of permanent mill locations.
3. Assist wood-using industries in making better use of markets.
4. Institute quality packaging and use of distinctive trade marks.
5. Encourage establishment of secondary wood-using industries of types discussed later in this report.

Outdoor Recreation:

1. Secure the technical services needed to plan outdoor recreation facilities. Services of a landscape architect are necessary.
2. Publicize the need for county-wide rural zoning to expedite recreation and summer home development.
3. Strengthen and extend recreation facilities now in process of development including the Stevens Lake project, Little Beaver Lake Recreation Area, New River Gorge, Grandview State Park and environs.

Rehabilitation of Strip Mines:

1. Thoroughly review the situation relative to restoration and revegetation of strip-mined areas.
2. Give strong support to the Reclamation Program of the Department of Natural Resources.
3. Examine existing legislation for adequacy.

PART I — FOREST RESOURCES

Forest land in Raleigh County can produce more timber of better quality and support a greater volume of timber-based industry.

Areas, Types, Condition

Raleigh County has an area of 386,560 acres. About 73 percent, somewhat more than 280,000 acres, is covered with forests. All the forest land is capable of producing species and grades of timber suitable for industrial use. The most productive sites are found in coves and lower slopes.

Oak and cove hardwood are the principle forest types and include more than 90 percent of the forested area. The valuable white pine type covers more than 12,000 acres and is increasing at an average rate of 100 acres per year.

Several species of oak make up about 35 percent of the total hardwood volume. Red oak is the principal component in the group. Yellow poplar is the most abundant single species and constitutes about 21 percent of the volume.

In timber of pole size, the largest volumes are in scarlet oak, chestnut oak, and yellow poplar. Large volumes of red oak, red maple, and beech are present.

Softwood timber is relatively small in volume but its importance in the timber business is increasing as white pine becomes more widely established.

Intensive use of timber resources coupled with damage by uncontrolled forest fires in earlier years is reflected in a large acreage of sapling and pole-size timber, in defective trees, slow rates of growth in some locations, and a large volume of sprout growth. In some areas, trees of the more desirable species have been reduced in number.

Nearly half the forest land is supporting little sawtimber though it is generally well stocked with trees of pole and sapling size. The balance, 55 percent of the total, supports varying amounts of sawtimber, some in excess of 5000 board feet per acre.

The table which follows indicates the area and percent of forest land in several size classes based on timber volumes.

Size Class	Acreage	Percent of Forested Acreage
1	12,145	4
2	47,716	17
3	96,058	34
4	125,286	45
Total	281,205	100

Size Class 1—Over 5,000 board feet per acre
2—3,500 to 5,000 board feet per acre
3—Over 600 cubic feet, but less than 3,500 board feet, per acre
4—Less than 600 cubic feet per acre

Where volumes are given in cubic feet the timber is mostly of pole size; 600 cubic feet is about equal to 7 cords.

Volume, Quality, Availability

Raleigh County timber stands contain a total volume of 713 million board feet of sawtimber of all species in trees 10 inches in diameter or larger. Of this total, 310 million board feet is in old growth stands on 21 percent of the area. Most of the balance, 335 million board feet, is in stands of intermediate size. Small pockets of operable volumes of timber are scattered about in young stands. The old growth stands are best suited for commercial sawtimber operations, but many of the smaller bodies of timber may also be economically harvested.

A total volume of 91 million cubic feet of pole timber is additional to the above quantities of sawtimber. This amounts to 1.1 million cords of wood and is in trees less than 10 inches in diameter and hardly desirable for sawtimber operations. They are, however, suitable for conversion into products like pulp, charcoal, small dimension, and posts.

During the appraisal, trees were graded according to quality of butt log and diameter. It was found that over half of the volume is in the trees more than 16 inches in diameter. This indicates that quality lumber can be produced from this timber at reasonable production cost. Nearly half of the volume is in trees whose first logs were classified in best and intermediate grades 1 and 2. Some of the grade 1 logs are of veneer quality.

The prevailing pattern of ownership has an important influence upon availability of timber. About 55 percent of the commercial forest land is in tracts of 1,000 acres or larger. Many medium-size mills express concern over their ability to secure adequate volumes of stumpage. This poses a real problem and is due to two factors:

1. On the larger properties the landowner is primarily interested in subsurface values and frequently disregards the renewable nature of the timber resource.

2. Financial and technical inability of the small sawmill operators to enter into long term contracts for the purchase of large timber tracts.

Raleigh County's timber resource of more than 700 million board feet represents a large supply of sawtimber suitable for the production of lumber and other items. However, in terms of raw material requirements of any major wood-using industry, it is important to note that this is only a portion of a total 5-county (Raleigh, Fayette, Summers, Mercer, and Wyoming Counties) sawtimber backlog of 3 billion board feet. The present roundwood supply of 1.1 million cords represents less than 10 percent of the total 5-county cordwood resource. It is apparent that an industry establishing a plant within Raleigh County could, if need be, augment its local supply of raw material with timber drawn from surrounding territory within economical hauling distance.

Forest Insects and Diseases Do Little Damage

Production of forest products is not seriously threatened by forest pests at the present time. Diseases and insects that might present problems are either under control or have not given indication of becoming widespread, or attaining epidemic proportions.

White Pine Blister Rust control measures were instituted in 1937. Presently the control zone totals 29,000 acres and is increasing at the rate of about 130 acres annually. The older acreage on which control measures have been applied for some years is in maintenance status.

The white-pine weevil is present but damage to date has been light and scattered. This insect is no more than a nuisance at present.

Diseases which followed damage from fires in the past, are numerous and severe. Many trees were fire scarred, thus giving entry to defect-causing fungi. Fomes annosus, a root rot, has been noted during the past year. By current indications it will not become a major problem in local forest management.

Oak wilt is present and control measures have been applied for a number of years. It is most prevalent in the west and southwest portions of the county. This is a serious disease, especially where there are large quantities of oak, but it isn't likely to materially affect timber production here.

Growth Exceeds Drain

In determining the ability of a forested area to support timber-based industry, an all-important factor is the relationship between growth and drain. In Raleigh County, this relationship is favorable because replacement by new growth exceeds the drain on timber resources.

Projection based upon present growing stock and growth in the last ten years indicate that the volume of sawtimber is increasing at the rate of 19 million board feet per year. Most of this increment is in old growth trees and pole stands. The growth rate in sawtimber stands averages 2.7 percent annually.

Pole timber is growing at an average annual rate of 9.6 percent, a volume increase of 8.8 million cubic feet per year. Using a converting factor of 85 cubic feet per cord this means a yearly increase of more than 100,000 cords of wood.

Sawtimber drain is about 15 million board feet a year. This indicates that growth exceeds drain by about 4 million board feet annually but there is a small additional though almost insignificant loss from fire, insects, disease, and miscellaneous uses.

In regard to drain on pole timber, an estimate places the cut of mine props at 4,000 cords annually. Some additional drain results from road construction, land clearing, fire, and procurement of minor products like fuel wood and fence posts but the amount is so small that the total reduction from all causes in pole timber is only a very small part of the annual growth.

At present rates of growth and drain, the existing forest industry can be maintained indefinitely at its present level and even increased appreciably. Under more intensive management growth rates can be increased by as much as three times in the younger stands thereby earning more income for the landowner and improving the overall economy of the area.

Timber Improvement Measures are Needed

In future years much of the timber needed by industry will come from present-day sapling and pole stands which comprise almost 80 percent of the total forest area. In order for these lands to produce adequate quantities of sawtimber of good quality and of the best kinds it is essential that rates of growth be accelerated and that composition of the forest be improved. Rates of growth may be speeded and composition of the forest and quality of the ultimate products may be improved by the application of improvement measures of four types— cull removal, thinning, weeding and planting.

A substantial portion of the forest land, about 150,000 acres, is in need of improvement so it is necessary to establish priorities in the application of work. Of highest priority are the cove hardwoods and white pine types. Within those types, the work should be first applied on the most productive sites.

In the cove hardwood type, work should consist of cull removal, in order to make room for trees of better quality.

Thinning is needed in overstocked stands of saplings and poles. With thinning, other improvements can be accomplished including the removal or deadening of deformed trees, those of less desirable species, and those of low vigor.

In the white pine type, release of white pine seedlings, saplings and small poles is of high priority and may be accomplished through the removal of culls and the deadening or sale of competing hardwoods. In this work the aim should be development of a mixed conifer-hardwood stand of 60 to 80 percent softwood species. Where a white pine seed source is available, commercial cuttings may be made with white pine regeneration as the objective, otherwise extension of this type will have to be by planting.

Planting offers the quickest way to establish tree growth on unproductive land or to bring about a desirable percentage of pine and other softwoods in understocked stands of mixed species.

An estimated 10,000 acres of land should be planted. It includes abandoned fields, otherwise barren land, understocked stands, and heavily cut-over lands. Most planting will need to be done by hand labor because topography and other factors make machine planting impracticable. About 600 trees should be planted on the average acre.

White pine should be favored in planting, but some hardwood and hemlock may also be planted in locations well suited for them. Planting will need to be followed in about three years by a program to release the planted trees from competing vegetation. Intensified fire and disease control programs will be needed during the early years of plantations.

A desirable timber stand improvement and planting program with estimated costs is included in the appendix (Table 6). Table 7 indicates planting, timber stand improvement, and woodland fencing accomplished in the last three years, most of it under the Agricultural Conservation Program of the U. S. Department of Agriculture.

Mining Affects Timber Production

Strip mining has reduced or eliminated tree growth on 6,500 acres of land, destroyed quantities of timber, and reduced the rate of growth on some areas of forest by lowering the water table. Additional losses of similar types have resulted from auger mining and building of associated roads and transmission lines. Plans are not made for placement of spoil material although it can, in many cases, be returned to its original location at little or no added expense.

During the last 17 years strip-mined areas increased at a rate of approximately 360 acres per year. Recently stripping has declined but augering has increased and has the same effect as stripping but on a small scale. Sometimes it causes additional damage by reentry on rehabilitated areas and nullifying efforts which have been made to revegetate the soil surface. Since 1959 augering has been classified in the deep mine category and is not bonded to assure restoration of areas.

Presently, removal of merchantable timber ahead of strip mining and augering is the usual practice. This eliminates waste but has no effect on the item of productivity.

The 6,500 acres mentioned above includes 1,500 acres which has been released from bond but needs vegetation. Another 1,000 acres still under bond needs to be rehabilitated. This makes a total of 2,500 acres on which work needs to be done and 60 percent of this can be planted to trees. Assuming that 1,200 trees are planted on the average acre a total of 1,800,000 trees will be needed for this purpose. Planting will require 6,000 man days of hand labor.

Forms of mining which seriously damage surface resources should be carefully studied for adequacy of rehabilitation laws, for proper classification of auger mining, to accelerate rehabilitation efforts, to control the number of roads built for removal of coal, to insure adequate planning for replacement of spoil material, and to make sure that usable timber will be salvaged ahead of mining operations.

Forest Land Ownership and Practice

Sixty percent of Raleigh County's total area is the property of 74 owners. Twenty-nine percent is owned by four. The table summarizes the ownership situation. (Map 5 shows general location).

Size in Acres	No. of Owners	Acres	Percent of County
300 - 1,000	36	20,096	5
1,000 - 5,000	28	61,472	16
5,000 - 10,000	6	38,490	10
10,000 or more	4	113,346	29
	74	233,404	60

Owners of these larger properties are mostly landholding subsidiaries of large corporations, investment groups, and individuals who acquired the land primarily for mineral resources. Most of these are out-of-State owners whose first interest is in mining. Local representatives are often mining engineers or attorneys with varying degrees of authority to execute contracts and leases.

The large holdings consist chiefly of forest land. Their timber resources and type of management are of vital importance in timber production. Timber sales are made on these lands with cutting based on stump diameters. Seldom is a penalty imposed for damage to standing timber and to watersheds. Most mining leases permit use of any timber needed in the mine, a practice which often results in heavy cutting of small trees. Forest fire protection is provided by the State but interest and cooperation in this item are increasing in the case of some land owners. Unsolicited business contacts with forestry agencies indicate an increasing interest in the timber resource and its management.

Intensive effort should be made, through use of educational programs, to expand this increasing interest on the part of large owners. This is important because of the essential position of the large tracts and also because the practices of the larger ownerships may influence activities on those of smaller size.

Demonstration areas constitute an excellent means of directing attention to good forest management and its value to an owner. Several of these should be established in the principal forest types with technical supervision provided by consulting foresters or by representatives of public forestry agencies.

EXISTING INDUSTRIES — PRODUCTION STATISTICS

Raleigh County Sawmills
(June 1, 1962)

Annual Capacity M.Bd.Ft.	No. of Mills	Estimated 1962 Production M.Bd.Ft. Lumber	Mine Timber	Total
0- 500	5	240	1,260	1,500
1,000-2,000	6	3,235	2,265	5,500
2,000 +	1	6,000	—	6,000
Total	12	9,475	3,525	13,000

M.Bd.Ft. — Thousand board feet.

Species Manufactured	Volume, M.Bd.Ft.
Red Oak Group	4,090
White Oak Group	1,220
Yellow Poplar, Basswood, Cucumber	3,215
Maple (60 percent sugar maple)	1,885
Hickory	1,185
Beech	570
Hemlock	400
White Pine	90
Walnut and Cherry	75
Other (Buckeye, ash, gum, etc.)	270
Total	13,000

1962 Sales Outlets, M.Bd.Ft.
Point of Remanufacture or Use

Product	Raleigh County	West Virginia	Out-of-State	Total
Hardwood Lumber	5	200	8,780	8,985
Softwood Dimension	470	20	—	490
Mine Timbers	3,525	—	—	3,525
	4,000	220	8,780	13,000

Existing Wood-Using Industries

Eleven circular mills and one band mill operate within the county and will produce an estimated 13 million board feet of lumber and sawn mine timbers in 1962. The circular mills have maintained a total annual production of approximately 6 million board feet during the past 5-year period, ranging from 5.3 million board feet in 1957 to an estimated 7.0 million board feet in 1962.

The band mill built in the western portion of the county in 1961 accounts for approximately 45 percent of the annual production of all mills. By the time full production is reached in 1963, this mill will be responsible for nearly 60 percent of the county's lumber output. The main features of the mill consist of log debarker, automated carriage and setworks, vertical resaw, double-end trimmer, lumber sorter and slab chipper. Production consists entirely of hardwood lumber going to a variety of regional markets in both a green and air-dried condition. Hardwood chips are shipped by rail approximately 200 miles to a pulp mill.

The circular sawmills range in size from small farm-based units to full time operations producing up to 1.5 million board feet per year. While the overall number of such mills and their total output remains about the same from year to year (10 mills averaging 600,000 board feet per mill), the industry is markedly unstable with regard to ownership and mill location.

During the five year period 1957-1962, 2 mills went out of business, 4 moved out of the county, 7 moved in the county and more than 20 different sawmill sites were occupied at one time or other. Only two mills remained permanently located. In other words, many mills are temporary installations dependent upon the availability of stumpage from nearby timber tracts.

The smaller circular mills are characteristically intermittent operations and heavily dependent upon the production and sale of sawn mine timbers. Equipment investments are low, as evidenced by the popularity of gasoline power units. Such mills typically operate their stumpage purchases with a combination woods-mill crew. The relatively small amounts of hardwood lumber produced are sold in a green and ungraded condition to concentration yards in the vicinity of Hinton.

A few of the larger circular mills produce enough hardwood lumber to make them relatively independent of the mine timber market for all but their lowest grades. Investment in such improvements as diesel power units, log turners, and log washing facilities has improved product quality and operational efficiency. Most of these mills operate on a year-round basis and maintain a woods crew independent of the mill crew. Two mills, accounting for 50 percent of the grade lumber production of all circular mills, attempt to air-dry most of their output. Other larger circular mills sell green, ungraded lumber, with much of it trucked to the hardwood lumber markets of Virginia and North Carolina.

Summarizing the production and marketing habits of circular mills, it is important to point out that:

1. Hardwood species account for 93 percent of total mill output.
2. Sawn mine timbers account for 50 percent of total mill output.
3. Green lumber (including sawn mine timbers) accounts for 75 percent of total output.
4. 86 percent of grade lumber production is shipped to out-of-state remanufacturers.

Expansion of existing industries seems improbable. Few of the mills occupy sites which would permit provision of additional log storage and lumber drying facilities. An increase in the present type of production would create an additional volume of low quality lumber which could not be absorbed by the market.

Two secondary wood-using industries are located in the Beckley area. One, a manufacturer of overstuffed furniture, plans to improve its competitive position by purchasing pre-assembled oak frames, or components thereof, from local sources. The other, a cabinet shop, has recently expanded its floor space and, with installation of a small dry kiln, expects to increase its hardwood consumption to 100,000 board feet annually.

Marketing Practice

The three major components of production are: 1) 4/4 hardwood lumber, 2) sawn mine timbers and 3) softwood dimension, in that order. Each is associated with an established marketing procedure, but until quite recently, all have been more or less dependent upon the timber requirements of the area's coal mines.

As stated earlier, approximately 50 percent of the grade hardwood lumber production is sold in green, rough-graded condition to area concentration yards or out-of-state remanufacturers. Average prices received for such lumber are subject to considerable variation, depending upon the proportion of lower grade material that is sawn into mine timbers.

In the currently active lumber market green millrun lumber is reported to bring about $70.00 per thousand board feet. Air drying generally increased lumber value $5.00 to $10.00 per thousand board feet.

The market for sawn mine timbers has declined steadily from a war-time high of some 25 million board feet. This has resulted in a uniformly low selling price (green FOB mill) of $40.00 per thousand board feet. However, mine timber conversion costs are low and volume recovery is high since all material is sawn 6/4 or thicker and dimension-defect tolerances are liberal.

Approximately 15 percent of the sawn mine timber production (some 500,000 board feet) is remanufactured by the primary processor. Cap block wedges are by far the most common item of remanufacture, with 10 out of the 12 county sawmills operating simple wedge-producing machines. Yellow poplar, red maple and black gum are preferred species for such wedges. (Table 8 - Appendix).

The softwood dimension component involves a relatively small volume of hemlock and white pine marketed green directly to local planing mills and retail lumber yards. The average selling price (green FOB mill) is $65.00 per thousand board feet and local demand is good.

The county's only band mill and largest lumber producer has solved its waste disposal problem by producing over 30 tons of hardwood chips per day and burning all sawdust and bark.

Circular mills located on roadside sites reduce their slabs to fuelwood lengths and sell it green at a nominal price to the local populace. The seasonal demand for sawdust by the dairy and poultry industry of the region and State Road Commission (highway ice and snow control) is sufficient to provide effective disposal on a gratis basis.

Secondary wood-using industries are too few and too small to have developed any characteristic system of production or marketing. While the contributions of these industries to the economy of Raleigh County are currently small, the inherent value potential of lumber remanufacture is sizable. For example, the sale of hardwood lumber currently returns approximately $70.00 per thousand board feet, yet such material could yield three to four times that value if processed into finished dimension stock.

As in the case of sawn mine timbers, the demand for round propwood has fallen off sharply in the past 15 years. Stumpage prices for mine props currently average 1c per lineal foot or roughly $4.00 per cord (128 cubic feet). Delivered to the mines, props bring about 4c per lineal foot or $17.00 per cord.

Raleigh County is just outside present procurement radius of hardwood pulp mills. An abundance of suitable pulpwood is available but its marketing will have to await future industrial development within marketing distance.

Additional Secondary Industries Are Needed

A very real need exists to develop remanufacturing facilities as outlined below, which will permit local communities to reap more economic benefits from the annual harvest of forest products. For raw material they would use the lumber manufactured by the present plants.

Dimension Stock Plant

A hardwood furniture dimension stock plant using locally manufactured lumber appears to offer good opportunities for development. Under consideration here is an installation with a daily lumber consumption of about 10,000 board feet, or approximately 3 million board feet per year. Such a plant requires modern dry kiln facilities and semi-automatic wood working equipment such as rip and cross-cut saws, planers and molders, glueing machines and sanders.

Estimated number of employees — 35

Estimated cost to install — $600,000.00

Fencing and Small Structures

This type of establishment is a logical adjunct to the small sawmill business inasmuch as it is largely dependent upon the availability of rough air dried lumber. Ornamental fencing of all kinds —rail, picket, lattice board, etc., can be produced from native wood.

The related manufacture of prefabricated wooden structures for farms and the growing recreation industry appears to be a feasible undertaking. With conventional woodworking equipment and simple facilities for preservative treatment, a great variety of items can be manufactured — from gates and livestock shelters to boat docks and picnic tables.

Estimated number of employees — 6

Estimated cost — $50,000.00

Wood Preservation

A small pressure treating installation utilizing pentachlorophenol or similar preservative holds a promising prospect. Native species are suitable for posts (including highway guardrail posts), structural timbers, decking, and short piling. Such a plant requires a 50-foot pressure cylinder plus the necessary auxiliary equipment.

Estimated number of employees — 5

Estimated cost — $75,000.00

Brush Blocks and Handles

A high proportion of the beech sawtimber in the county is presently sawn into mine timbers. This species is admirably suited to the requirements of the brush block industry. Depending upon lumber purchases amounting to some 2 million board feet annually, an operation of this type would require dry kiln facilities plus conventional wood-working machinery.

Estimated number of employees — 25

Estimated cost — $100,000.00

Particle Board

In view of the many types of mills included in this category, involving a wide range of raw material requirements, the opportunities for such an industry should be studied further.

Veneer - Plywood Plant

The suitability of this area for installation of a veneer and plywood plant requires additional study. It is significant, however, that sizable amounts of yellow poplar and oak lumber are being shipped to out-of-state manufacturing plants. Tree species and log sizes in the area suggest a large volume suitable for veneer.

Charcoal Plant

Manufacture of lump charcoal can be instituted along two lines. One is to produce bagged charcoal for the local retail market—an outlet which will grow with recreational developments in the area. The other is to produce charcoal in bulk for a guaranteed market at some existing briquetting plant. Either installation is a logical adjunct to a sawmill.

Estimated number of employees — 5

Estimated cost — $30,000.00 - $50,000.00

In conjunction with the development of a hardwood dimension plant, there is an opportunity for an area band mill capable of producing 3 to 4 million board feet of lumber per year. A mill of this size should be located on a railroad siding and should include such equipment as a live log deck, automatic carriage and setworks, double-end trimmer, dip tank and green chain, lumber sorter, fork lift and drying yard facilities. Provision should be made for the installation of log debarker and chipper. Necessary woods equipment include crawler tractors, a mobile log loader and large capacity log trucks.

Estimated number of employees — 25

Estimated cost — $225,000.00

Successful development of many of the wood-using industries described in the preceding paragraphs would depend in part upon the supply of skilled and semi-skilled labor. Recent statistics from the West Virginia Unemployment Office indicate that there are approximately 60 unemployed workers in Raleigh County with experience in woods or sawmill operation, plus an additional 200 unclassified workers half of whom may be considered available for woods-mill employment. In other words there is a definite shortage of skilled wood workers in the area. Thus, the establishment of a secondary wood-using industry should be accompanied by a specific labor training program.

Log Procurement

Stumpage purchases constitute the most important source of raw material for Raleigh County sawmills. Mills customarily buy tracts of sawtimber on either a lump sum or specified rate per thousand basis. They harvest such timber with their own logging crews or by arrangement with logging contractors. Under such conditions, there has never been an opportunity for a program of log buying to develop; in fact, only one of the small mills buys a portion of its requirements in log form.

Area sawmills commonly purchase stumpage on a two-price, mill-scale basis: an average of $5.00 per thousand board feet for sawn mine timbers and an average of $14.00 for lumber. Inasmuch as the volume of lumber produced in the county is nearly 2½ times as great as mine timber production, the current stumpage price for all sawtimber is approximately $11.00 per thousand board feet.

The average log trucking distance for present mills is 6 miles. Logging costs vary from $15.00 per thousand board feet in the eastern plateau section to as high as $35.00 per thousand for the rough terrain of the Coal River watershed.

Timber sales are commonly conducted on a basis of diameter limit. Where mine props are part of the harvest, this diameter limit may be as low as 8 inches at the stump. On larger sawtimber sales, a limit of 16 inches at the stump is customarily observed.

The advent of larger sawmills or other large wood industries will bring about a need for independent woods and timber operators who perform logging services on a contract basis. Such a development will eventually lead to operations in which the logger becomes the timber buyer who markets logs at the market which offers the highest return. Veneer logs go to a plywood plant, sawlogs to a mill, specialty bolts to a specialty plant, etc. This type of logger will need to pay close attention to timber quality, round-wood specifications, etc. in order to channel each item into its highest use.

A typical investment, needed to produce 10 thousand board feet of logs per day under a variety of operating conditions, is as follows:

Item	*Cost*
2 chainsaws (gear-driven, 7 hp)	$ 750.00
1 tractor with blade and winch (45 hp size class)	17,650.00
1 mobile log loader (used) (crane or shovel type)	2,600.00
1 heavy duty log truck (tandem axle, air brakes)	10,000.00
1 light log truck (single axle, 8-ton capacity)	5,000.00
Miscellaneous equipment	500.00
	$36,500.00

Estimated number of employees — 8
Estimated weekly payroll — $500.00

Technical Assistance Is Often A Must

It goes almost without saying that goods and services to be sucessful in the highly competitive markets of today must be of the best quality. Technical assistance in forest management and in wood technology is often needed to bring about desirable improvements in timber production and in converting timber into goods for the market.

A number of consulting foresters with offices in West Virginia can provide technical guidance in forest management, marketing, and utilization. They are:

Tillinghast and Neeley	Danville
Thomas Clark	Morgantown
Ben York	Princeton
Henry Sipe	Elkins
Eugene Shreve	Buckhannon

Employment of these men can be very helpful in upgrading an owner's management of his timber. The most frequently rendered services are: preparation of long range management plans, timber appraisals, sale administration, timber stand improvement, marketing forest products, and acting as agents for absentee owners.

Public guidance is available for woodland owners in the form of a cooperative forest management program. Foresters in this program are employed by the State and are particularly helpful in advising owners in woodland management and in processing and marketing forest products. A District Forester employed by the West Virginia Department of Natural Resources has an office in Beckley and is responsible for administration of this program in the southern part of the State.

Assistance in soil and water conservation problems related to timber production and processing may be obtained from the Raleigh County Soil Conservation District office.

If the forests of Raleigh County are to be of maximum benefit to their owners and the people generally, technical services must be adequate to provide the timberland owner and the processor with advice that may be needed in every activity from the planting of a tree to the final stages of manufacture.

PART II — RECREATION RESOURCES

Existing Facilities

A number of facilities have been prepared for public recreation in Raleigh County, although they are not highly developed and are not equipped for camping.

Developed recreation areas and facilities include:

1. *Grandview State Park* — 878 acres with trails, picnic sites, outdoor theatre, and vistas overlooking New River Gorge.
2. *Little Beaver Lake Recreation Area* — 420 acres, including a 14-acre lake, row-boating, fishing, swimming, and picnicking.
3. *Flat Top Lake* — A 5,000 acre watershed with 230 acres of water, summer and year-long residences.
4. *Bald Knob Winter Sports Area* — facilities for skiing and ice-skating.

Opportunities for dispersed forms of recreation include 31 miles of warm water fishing in New River, 30 miles of cold water fishing (trout) on 5 smaller streams, fishing in Beckley City Reservoir, and hunting for deer, bear, and (especially) for small game.

Raleigh County is well situated for recreation use and has a lot of land suitable for development of facilities for outdoor recreation.

Sites Suitable For Development Are Numerous

A delightful climate, good scenery, variable topography, and ready accessibility from centers of population give Raleigh County a very high potential as a public recreation center. Construction of a number of water impoundments and of adequate secondary roads together with provision and proper maintenance of well-designed facilities will attract large numbers of people. It is also essential that disfigurement of the landscape and stream pollution be held to a minimum or, preferably, eliminated entirely.

Greatest natural handicap to recreation development is a shortage of water areas. This deficit can however, be offset by man-made impoundments at a number of sites where such developments are economically feasible. Water areas are a major attraction but related items like motels and restaurants are also essential.

Possible water impoundment areas are listed in Appendix Table 9. Careful engineering studies must precede development of a site and should take into account size of watershed, water quantity and quality, shoreline terrain, present improvements, access, and total benefits in relation to costs. Similar studies will indicate the most suitable type of development.

According to Soil Conservation Service records, 274 farm ponds have been built in Raleigh County and there are suitable locations for 500 more. Those which are readily accessible might become the principal features of family type camping and picnicking developments.

A most immediate major recreational opportunity lies in completion of Stevens Branch Lake and accompanying facilities. Here is a site of 2,300 acres with 308 acres of water. Plans include occupancy sites, motor boating, water skiing, swimming, and fishing facilities. This is a county project financed by the sale of bonds. It is a major step in development of woodland recreation and, when finished, will be a popular attraction.

Enlargement of Grandview State Park and expansion of its facilities is another prospective development of promise. Here is an excellent opportunity to provide additional woodland recreation which will help Raleigh County become an outdoor recreation center. Installation of campsites is a primary need. Expansion of the trail system for hiking and horseback riding is another need. Opportunity exists for rental cabins or complete lodge facilities.

Little Beaver Park should be rehabilitated. It has a pretty little lake, is well situated, and sufficient land is available for expansion.

Plans should provide for campsites and more picnic sites. This park has a special attraction,— the only controlled swimming facility at a public woodland recreation area in the county.

Flat Top Lake, a private residential and summer home area, is outstanding. Similar developments at other sites would provide tourist attraction and a corresponding increase in recreational dollars spent in Raleigh County. These projects could be private, private and public, or completely public though probably best suited for operation by private investors. Periodic rentals such as are customary at the shore areas of New Jersey and elsewhere can provide added income.

The New River Gorge is a natural attraction where a number of areas (See Map 4 - Appendix) are suitable for development. These are found both along the rim and adjacent to New River. Summer rental cabins, summer homes, camp and picnic sites, or even a resort lodge, are possibilities. Other types of recreation to be considered include hiking and horseback trails. Coal prospect roads are available for such enterprises with a small amount of additional work. Swimming can be added by building small impoundments.

Another type of recreation facility needed is the organization camp. This type of group camp, if complete facilities are provided, can add greatly to the economy of the immediate area. Suitable land can be found in almost any part of the county.

Winter recreation has an uncertain future due to undependable winter weather. The existing ski-development has been plagued by mild, snowless winters insufficiently cold to permit operation of artificial snow machines.

Additional locations suitable for camping or picnic areas and fishing lakes or combined recreation uses are located along main routes of travel and at existing prospective impoundments with suitable adjacent terrain.

Analysis and Summation of Recreation Resources

Raleigh County has many fine possibilities for development of recreational facilities. Outstanding installations have been made by public and private endeavor. Grandview State Park with its historical pageant "Honey in The Rock" and Flat Top Lake provide concrete evidence of high level planning. Future facilities oriented to man-made impoundments or to the New River and its scenic gorge will surely be to corresponding standards.

Stevens Lake Recreational area is further evidence of progressive thought and action typifying Raleigh citizens and their County Court.

The following items are essential to orderly development:

1. Stevens Lake be financed for early completion.
2. Rural Planning and Zoning measures be studied on a county-wide basis to protect present and future investments.
3. Small private recreational developments for camping, picnicking, and fishing should be encouraged.
4. Existing facilities should be critically examined for improvement needs.
5. Plan for diversified recreational developments to meet future demands.
6. Review secondary road system for improvement to higher standards.

Even though Raleigh County has many of the factors necessary for a good, diversified recreation program, disadvantages also exist. Some or all of these can be eliminated or minimized. One of the biggest disadvantages and the most difficult to correct is the nature of the secondary road system. Tourists are not attracted to areas with sub-standard roads.

Mining operations have reduced the aesthetic value of some scenic areas. Examples are the views from the main and north outlooks of Grandview State Park. Lack of land use planning and rural zoning is partially responsible. A committee on land planning and rural zoning is now being considered by the County Court. Mining cannot be eliminated but carefully thought out restrictions as to its location can improve recreational prospects. Mining is by no means the only offender. Poorly located junk yards, roadside trash and garbage dumps, dilapidated billboards and buildings, and other eye-sores are also objectionable and, where present, should be eliminated.

APPENDIX

Timber Examination Methods

Circumstances indicated need for a method of reconnaissance which would provide the information required without intensive field examination. The method used has served to meet objectives within required limits of accuracy.

Aerial photographs taken in 1957 were studied and stand size classes and plantable* area were delineated. Stand sizes were separated into 4 classes on the basis of board foot and cubic foot volume. Definitions of these size classes follow:

1. Over 5,000 board feet per acre.
2. 1,500 - 5,000 board feet per acre.
3. Over 600 cubic feet but less than 3,500 board feet per acre.
4. Less than 600 cubic feet per acre or trees under 6 inches in diameter breast height.

The minimum acreage delineated was 50 acres for stand size classes and 5 acres for plantable area.

Photo interpretations were field checked in sufficient instances to insure appropriate accuracy. Road checks also were made to coordinate the ground conditions to the photo mosaic from which a map was traced (Map 2 - Appendix). Acreage was determined from the map by the use of the planimeter and dot grid. Plantable acreage was taken directly from the photographs by the dot grid method.

To determine volume, size and quality of the timber "10 factor" basal area plots were taken randomly, the number of plots being distributed between stand size classes.

Volume is based on data from 140 points.

Growth data are based on increment core measurements as obtained from Northeastern Forest Experiment Station records of trees examined in Raleigh and adjacent counties (143 trees), and samples taken on the project in the county (112 trees).

* Nonstocked or poorly stocked forest land or nonforest land on which the establishment of forest tree cover is desirable and practical, and regeneration will not occur within a reasonable time.

Table 1. NET VOLUME OF TIMBER BY STAND-SIZE CLASSES

Stand-size Class	Acreage	Average Saw Timber Volume/Acre (Net) Board feet	Average Pole Timber Volume/Acre (Net) Cubic feet*	Total Saw Timber Volume Board feet	Total Pole Timber Volume Cubic feet
1	12,145	5,343	126.1	64,890,735	1,531,485
2	47,716	5,143	259.9	245,403,388	12,401,388
3	96,058	3,485	391.0	334,762,130	37,558,678
Saw Timber Stands Total	155,919	—	—	645,056,253	51,491,551
4	125,286	546	319.5	68,406,156	40,028,877
All Stands Total	281,205	—	—	713,462,409	91,520,428

* 85 cubic feet = one cord

Table 2 NET VOLUME OF TIMBER BY SPECIES

Species	Saw Timber Thousand Board Feet	Pole Timber Thousand Cubic Feet
Hardwoods		
Yellow Poplar	159,120	12,280
Red Oak	108,670	9,584
Chestnut Oak	49,950	12,951
Scarlet Oak	35,360	17,831
White Oak	32,260	3,677
Black Oak	27,370	2,556
Hickory	67,700	4,249
Basswood	51,190	3,008
Sugar Maple	30,450	5,693
Red Maple	33,160	8,398
Beech	32,380	4,454
Cucumber	28,110	239
Black Gum	12,860	250
Black Birch	10,880	635
Buckeye	9,830	788
White Ash	9,330	395
Black Walnut	1,250	—
Black Locust	1,150	1,413
Black Cherry	570	—
Yellow Birch	—	365
Other	3,570	2,369
All Hardwoods	705,160	91,135
Softwoods		
Hemlock	8,300	386
All Softwoods	8,300	386
All Species	713,460	91,521

Table 3 QUALITY COMPOSITION OF HARDWOOD SAW TIMBER

Species or Species Group	Saw Timber Volume Thousand Board Feet	Saw Timber Volume Percent	Tree Grade Distribution Grade 1 Percent	Tree Grade Distribution Grade 2 Percent	Tree Grade Distribution Grade 3 Percent
Yellow Poplar	159,120	23	20	37	43
Red Oak	108,670	15	44	22	34
Chestnut Oak	49,950	7	16	18	66
Scarlet Oak	35,360	5	0	17	83
White Oak	32,260	5	18	20	62
Black Oak	27,370	4	9	18	73
Basswood and Cucumber	79,300	11	19	37	44
Hickory	67,700	10	5	23	72
Beech	32,380	5	11	6	83
Red Maple	33,160	5	8	35	57
Sugar Maple	30,450	4	17	20	63
Black Birch	10,880	1	14	33	53
White Ash	9,330	1	47	23	30
Others	29,230	4	33	23	44
All Hardwoods	705,160	100	20	27	53

Table 4 SAW TIMBER VOLUME BY DIAMETER CLASSES

Thousand Board Feet

Species	Diameter in inches 10 to 14	16 to 20	22 or more	Total Volume
White Ash	2,560	2,870	3,900	9,330
Basswood	18,760	22,840	9,590	51,190
Beech	12,390	12,720	7,270	32,380
Black Birch	6,880	3,140	860	10,880
Buckeye	810	4,770	4,250	9,830
Black Cherry	570	—	—	570
Cucumber	7,420	14,350	6,340	28,110
Hickory	48,590	18,030	1,080	67,700
Black Locust	1,150	—	—	1,150
Sugar Maple	8,290	9,400	12,760	30,450
Red Maple	18,810	10,320	4,030	33,160
Black Oak	19,640	6,490	1,240	27,370
Red Oak	30,530	55,270	22,870	108,670
Scarlet Oak	14,030	17,970	3,360	35,360
Chestnut Oak	28,570	12,070	9,310	49,950
White Oak	13,340	14,480	4,440	32,260
Yellow Poplar	96,760	55,140	7,220	159,120
Black Gum	2,690	10,170	—	12,860
Black Walnut	470	780	—	1,250
Others	3,570	—	—	3,570
Hemlock	—	—	—	8,300
Total	335,830	273,670	103,960	713,460
Percent of Total	47	38	15	

Table 5 PROJECTED GROWTH OF GROWING STOCK PER ACRE PER YEAR AND FOR 10-YEAR PERIOD BY STAND-SIZE CLASSES

Stand-size Class	Acreage	Saw Timber Increment Per Acre/Yr. Board Feet	Pole Timber Increment Per Acre/Yr. Cubic Feet	Total Increment per year Saw Timber Board Feet	Total Increment per year Pole Timber Cubic Feet	10-Year Increment Saw Timber Board Feet	10-Year Increment Pole Timber Cubic Feet
1	12,145	131.3	8.13	1,594,638	98,739	15,946,385	987,388
2	47,716	131.9	15.08	6,293,740	719,557	62,937,404	7,195,573
3	96,058	97.0	23.87	9,317,626	2,292,904	93,176,260	22,929,045
4	125,286	17.1	45.49	2,142,391	5,699,260	21,423,906	56,992,601
Total All Stands	281,205	—	—	19,348,395	8,810,460	193,483,955	88,104,607

Table 6 TEN-YEAR PLANTING PROGRAM

Conifer (White Pine) Total Acres	Planting Per year (Acres)	Cost Trees Per Acre	Cost Supervision & Transportation (Per Acre)	Cost Labor Per Acre	Project Cost Per Year	Years to Complete	Total Cost
10,000	1,000	$9.00	$10.33	$20.67	$40,000.00	10	$400,000.00

5,000 acres interplanting — 600 trees per acre hand planted

5,000 acres retired fields — Approximately 2,000 man days planting per season

TWENTY-YEAR TIMBER STAND IMPROVEMENT PROGRAM

White Pine Type

Present Acreage	To Improve Each Year Acreage	Supervision and Transportation Cost Per Acre	Labor Cost Per Acre	Project Cost Per Year	Years to Complete	Total Cost
9,000	450	$5.00	$10.00	$ 6,750.00	20	$135,000.00
*Hardwood Stand Size 1 and 2						
40,000	2,000	$1.33	$ 2.67	$ 8,000.00	20	$160,000.00
*Hardwood Stand Size 3						
48,000	2,400	$3.33	$ 6.67	$24,000.00	20	$480,000.00
*Hardwood Stand Size 4						
60,000	3,000	$3.33	$ 6.67	$30,000.00	20	$600,000.00

* See Page I for definition.

Timber Stand Improvement will require 4,500 man days per year.

Table 7 TIMBER IMPROVEMENT ACCOMPLISHED

Trees Planted Raleigh County

1960	55,700
1961	132,400
1962	130,200

Timber Stand Improvement (ACP Program) Raleigh County

1960	373 acres
1961	204 acres

Fencing of Woodland (ACP Program) Raleigh County

1960	1019 rods
1961	760 rods

Table 8 PRINCIPAL ITEMS, SAWN MINE TIMBERS

Item	Average Dimension	Representative Percent
Headers	3" x 8" x 12'	38
Cap Blocks (Half-headers)	2" x 6" x 18"	37
Wedges	4 per bd. ft.	15
Ties	5" x 7" x 6'	7
Crib Blocks	5" x 7" x 2'	3
		100

Table 9. LOCATION OF POSSIBLE IMPOUNDMENTS

DRAINAGE	Surface Area Acres				
	20-49	50-99	100-199	200-299	300+
Coal River					
Clear Fork					
Upper		50			
(Spruce School)			180		
Workman Creek		60			
(Workman Creek School)			100		
Toney Fork		90			
(Artie)		70			
White Oak	35				
Lem Fork	40				
Sycamore		55			
Marsh Fork					
Shockley Branch * (Upper)		60			
" " * (Lower)	20				
Laurel Branch (Upper)		80			
" " (Lower)		90			
Jehu Branch *	40				
Ugley Branch *		80			
Dingess Branch (Upper)			100		
" " (Lower)			100		
Surveyor Creek				240	
" " (Hoohoo)		60			
" " (Tolleys)		90			
Rockhouse Fork					
" " (Upper)		50			
" " (Upper No. II)		60			
" " (Upper Bryson		60			
" " (Lower)					550
" " Maple Meadow Creek		50			
Spanker Branch *			150		
" " (Shiloh School)			130		
Breckenridge Creek (Upper)					650
" " (Lower)		50			
Cove Creek	40				
Sandlick Creek (Upper)				250	
" " (Lower)					620
" " Spur	40				
Cook School	25				
Rock Creek	25				
" " (Right-hand Fork)		60			
Dry Creek	35				
Peachtree Creek	25				
" " Drews Creek (Upper)		70			
" " " " (Lower)	35				
Horse Creek	40				
Little Marsh Fork	35				
Sub-Total Coal River	435	1185	760	490	1820

* In Marsh Fork Flood Control Project

DRAINAGE	Surface Area Acres				
	20-49	50-99	100-199	200-299	300+
Guyandot River					
Slab Fork - Burnt Fork (Upper)	40				
" " " " (Lower)	35				
" " " " Richardson Branch (Upper)		60			
" " " " " " (Lower)	45				
Allen Creek (Upper - I)	40				
" " (Upper - II)		60			
" " Middle		60			
" " Lower		60			
Winding Gulf (Upper)		70			
" " Lower		50			
" " West Fork		90			
" " Mullens Branch	40				
" " Alderson Branch	25				
Stonecoal Creek - Pines Creek		50			
Laurel Fork	30				
Riffle Branch - Upper	35				
" " Lower	20				
Tommy Creek - Upper	25				
" " - Middle	40				
" " - Lower		50			
" " - Bragg Branch	40				
Devils Fork Bluft Fork			110		
Meadow Fork		50			
Richland Hollow	40				
Upper		50			
Lower		60			
Sub-Total Guyandot River -	455	710	110		
New River					
Paint Creek - Upper			160		
Middle		80			
Lower	30				
No. Sand Branch - Upper		85			
Lower		50			
Maple Fork			150		
Dunloup Creek	40				
" " Mill Creek					
" " No. 1	30				
No. II	35				
No. III		50			
No. IV		70			
No. V			100		
Batoff Creek - Upper		50			
Lower		55			
Piney Creek - Upper			140		
Bowyer Creek - Upper	40				
Lower		50			
Takein Creek		60			

DRAINAGE		Surface Area Acres				
		20-49	50-99	100-199	200-299	300+
New River (continued)						
Piney Creek (continued)						
(Cedar)			50			
Turkey Branch		30				
Craborchard Creek-Upper				100		
Lower			60			
Soak Creek					210	
Stover Fork - Upper				170		
Middle			50			
Lower			60			
Whitestick Creek - Upper	I			150		
	II			100		
	III		60			
	IV	40				
Little Whitestick Creek	I			130		
	II			160		
	III		50			
	IV		60			
Cranberry Creek	I	40				
	II		50			
	III		80			
	IV					400
Fat Creek	I			100		
	II		55			
	III		50			
	IV	40				
	V		70			
Beaver Creek - Upper	I		80			
"	II				230	
"	III	40				
Cherry Glade	I		50			
	II		70			
Left Fork	I		60			
	II		60			
	III		50			
	IV		50			
	V	30				
Rock Branch				120		
Glade Fork	I			110		
	II	45				
Middle	I			190		
	II	40				
Sand Branch		40				
Little Beaver Creek						
Upper	I					360
	II		70			
	III		80			
Middle	I		60			
	II			160		
	III		50			
	IV			100		
Lower				180		

DRAINAGE		Surface Area Acres				
		20-49	50-99	100-199	200-299	300+
New River (continued)						
Mill Creek	I	40				
	II	40				
	III		60			
Glade Creek -	Beaverpond Branch I					410
	Farley Creek				240	
	Oak Creek				270	
	Middle I		80			
	II			110		
	III				210	
	IV			170		
	Cooper Creek				270	
	Lefthand Fork			120		
	Lower I		65			
	II	40				
	III	40				
	IV		50			
	V	40				
	Pinch Creek - Upper				220	
	Lower			180		
	Main			150		
	Polls Branch	35				
Sewell Branch		40				
Mill Branch		40				
Sub-Total New River		835	2180	3050	1650	1170

Table 10

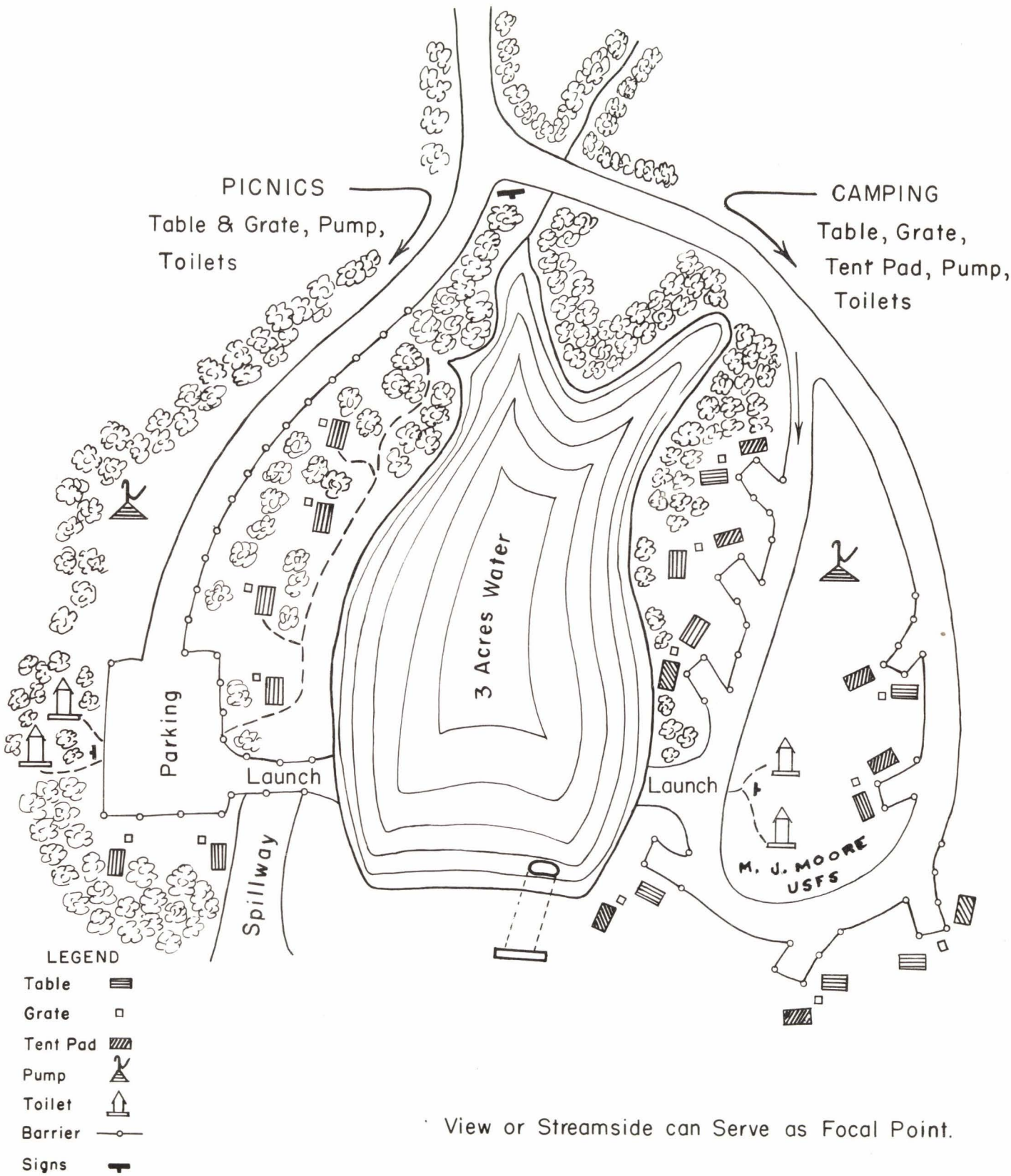
Summary Table

Surface Area Acres

TOTAL	20-49	50-99	100-199	200-299	300+	Total w/o(20-49)	Total w/20-49)
New River	835	2180	3050	1650	1170	8050	8885
Guyandot River	455	710	110	___	___	820	1275
Coal River	435	1185	760	490	1820	4255	4690
Total	1725	4075	3920	2140	2990	13125	14850
No. of Sites	48	66	29	9	6	110	158
Average	36	62	135	238	498	119	94

Potential Impoundment Work
by
William Johns, R-7, USFS

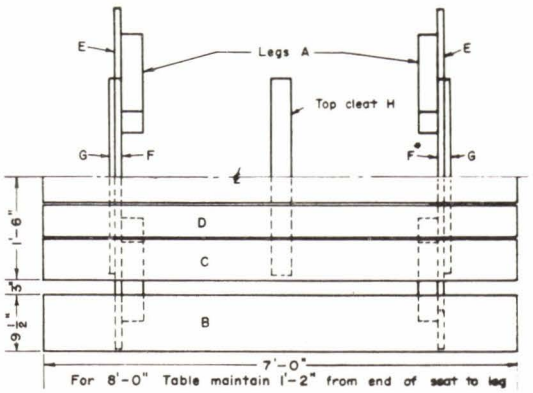
TYPICAL RECREATIONAL DEVELOPMENT FOR LAND OWNERS



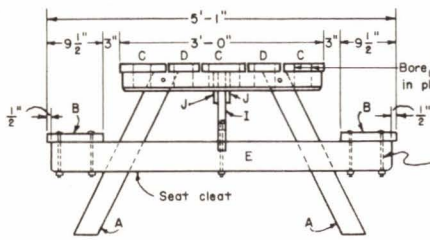
View or Streamside can Serve as Focal Point.

PICNIC TABLE & TOILET (pit type)

FACSIMILE



PLAN

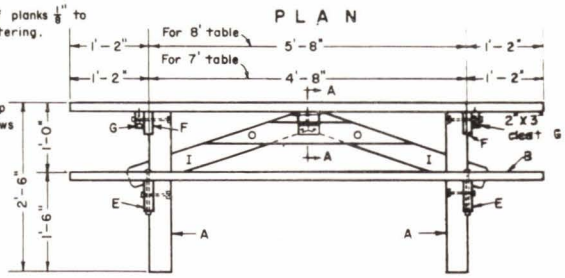


END VIEW

Note: Ease edges of planks $\frac{1}{8}$" to prevent splintering.

Bore $\frac{3}{16}$" ϕ lead holes $\frac{3}{4}$" deep in planks for $\frac{3}{8}$" lag screws

$\frac{3}{8}$" ϕ - C.B. Washers both ends



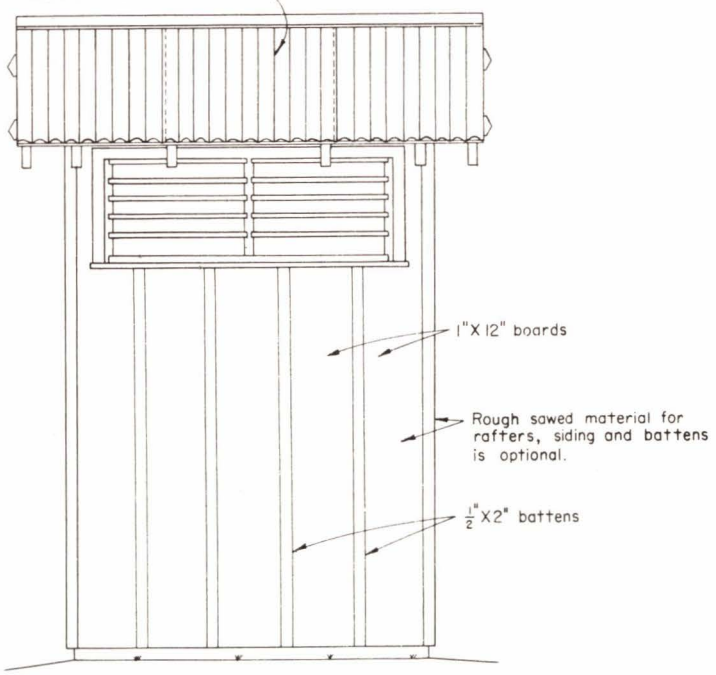
SIDE VIEW

0 3" 6" 9" 1' 2' 3' 4'

Scale

FACSIMILE

$\frac{1}{2}$" X 2$\frac{1}{2}$" corrugated transluscent fiber glass roofing corrulux or equal. Install in accordance with manufacturer's instructions.



SIDE ELEVATION
(OPPOSITE SIDE SIMILAR)

0 3" 6" 9" 1' 2' 3'

Scale

Detailed plans available from West Virginia Department of Natural Resources, Charleston.

APPROXIMATE COSTS

(of installing camping and picnicking facilities for family-type use — includes labor & material per family unit). Table, grate, toilet and safe water.

Table		$45.00
Grate		
Stone		32.00
Charcoal grill		26.00
Tent pad		20.00
Trash can		2.00
Barriers		
Guard rails, posts		60.00
Road		
Clearing 100 feet		20.00
Grading 100 feet		40.00
Surfacing 100 feet		40.00
Park spur		
Clear		20.00
Grade		20.00
Surface		20.00
Toilets - (2)	@ $400./10 units	80.00
Well & Pump - (1)	@ $400./10 units	40.00
Landscaping		40.00

Variable according to situation, access, available labor and degree of development.

BREAKDOWN OF INVESTMENT AND RETURNS ON FAMILY-OWNED AND OPERATED CAMPING SITE (THEORETICAL)

Investment	
5 acres of suitable land (location and slope)	
30 camp units @*$180/unit	$5400.
Roads ½ mile @ $2000/mile	1000.
Parking spurs and barriers	600.
2 wells and hand pumps	1000.
* includes toilets	$8000.
Annual Costs	
License to Operate	—
Labor for maintenance and cleanup (720 hrs./yr. @ $1.25/hr.)	$ 900.
Maintenance of facilities	—
Returns (90 day season)	
30 Camp units w/possible 2700 unit days	
Potential 50% use — 1350 unit days @ $2.00	$2700.

** Costs may be lowered and income increased if part of construction and policing is done by the owner.

ESTIMATED INVESTMENT AND RETURNS FOR A COMMERCIAL FISHING POND

Investment

Dam for 3 acre lake	—	$1200
10 Picnic units	—	1350
10 Camping Units	—	1500
Roads & parking lots	—	1200
2 wells & hand pumps	—	1000
Small registration & concession building	—	500
Water aerator for lake	—	300
		$7050

Annual Costs (partial list)

License to operate	—	$ 25
Weekly fish stocking - 150-400 lbs./week	—	—
Labor for maintenance, clean-up, grass mowing, etc. 1920 hours @ $1.25 per hr.	—	$2400
Fertilizer for lake	—	$ 66 - $75
Algae control	—	—

Potential Returns 90-day Camping and Picnicking Season

10 picnic units (possible use 2 times/daily or 1800 unit days)	Potential use ½ time @ $1./family	$900
10 camping units (possible 900 unit days)	Potential use ½ time @ $2./night	900

150 Day Fishing Season

Possible use based on average week-end days and holidays - total 3000 customers and average 10 customers/day for 115 days)	4150 pole days @ $1.50/pole	$6225
	Total Income Per Year	$8025

FLAT TOP LAKE
AT GHENT
RALEIGH COUNTY

For Summer & Yearlong Residence

Forested Watershed	5,000 Acres
Basic Installations	1949-53
Dam, Concrete Core; Water	300 Acres
Surfaced Roads	10 Miles
Water front lots	374
Homes Built	120

Inquiries from Community groups interested in similar development are welcome.

Reference No. 20

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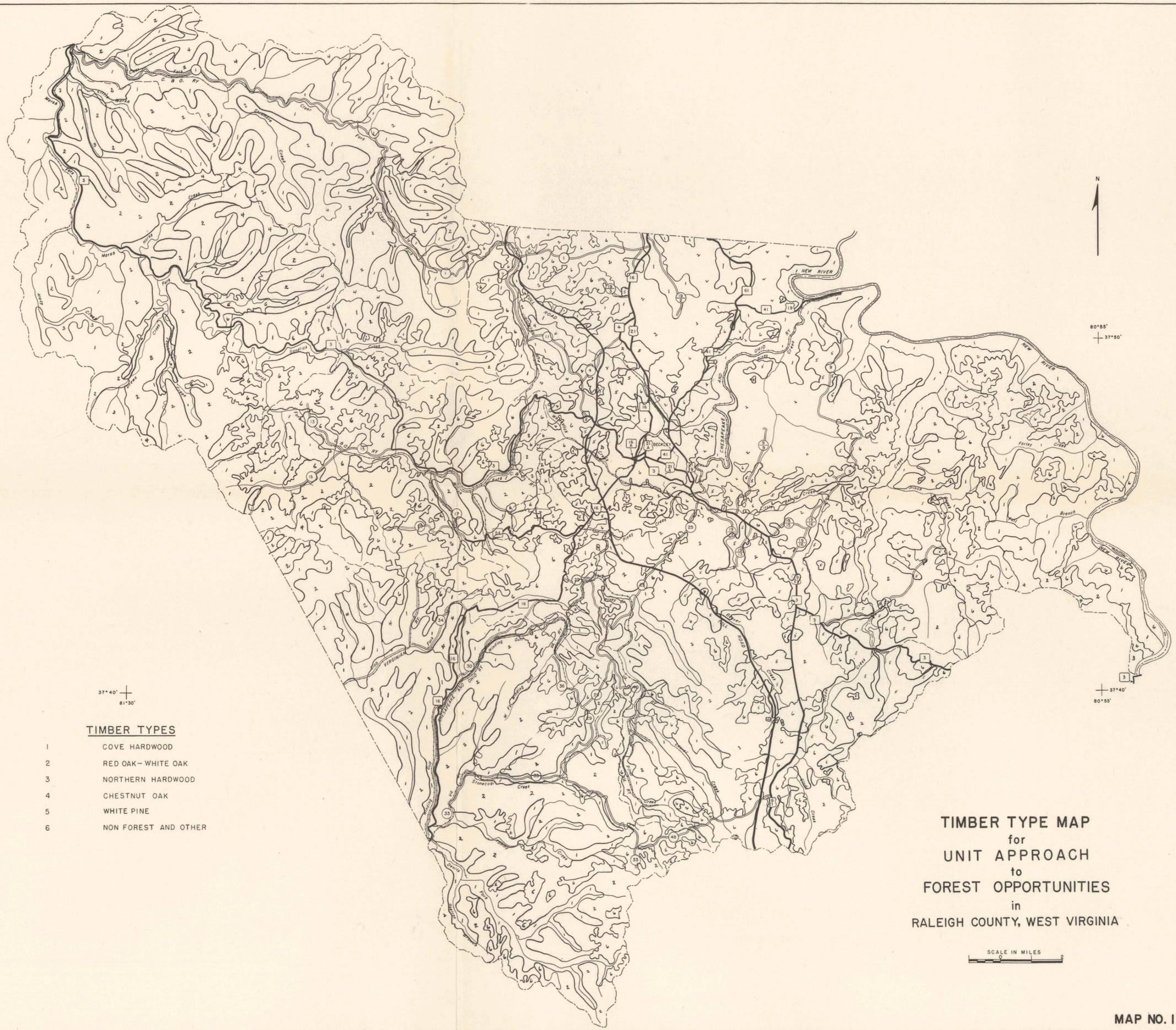


37°40'
81°30'

TIMBER TYPES

1	COVE HARDWOOD
2	RED OAK – WHITE OAK
3	NORTHERN HARDWOOD
4	CHESTNUT OAK
5	WHITE PINE
6	NON FOREST AND OTHER

TIMBER TYPE MAP
for
UNIT APPROACH
to
FOREST OPPORTUNITIES
in
RALEIGH COUNTY, WEST VIRGINIA

SCALE IN MILES
0 1 2

MAP NO. 1

N

GRANDVIEW STATE PARK

37°40'
81°30'

1 Stand Size 1– 5000 bd. ft., Plus.

2 Stand Size 2– 3500–5000 bd. ft.

3 Stand Size 3– 600 cu.ft. but less than 3500 bd. ft.

4 Stand Size 4– less than 600 cu. ft., or open fields.

TRACED FROM 1957 PHOTO MOSAIC

STAND SIZE CLASS MAP

for

UNIT APPROACH

to

FOREST OPPORTUNITIES

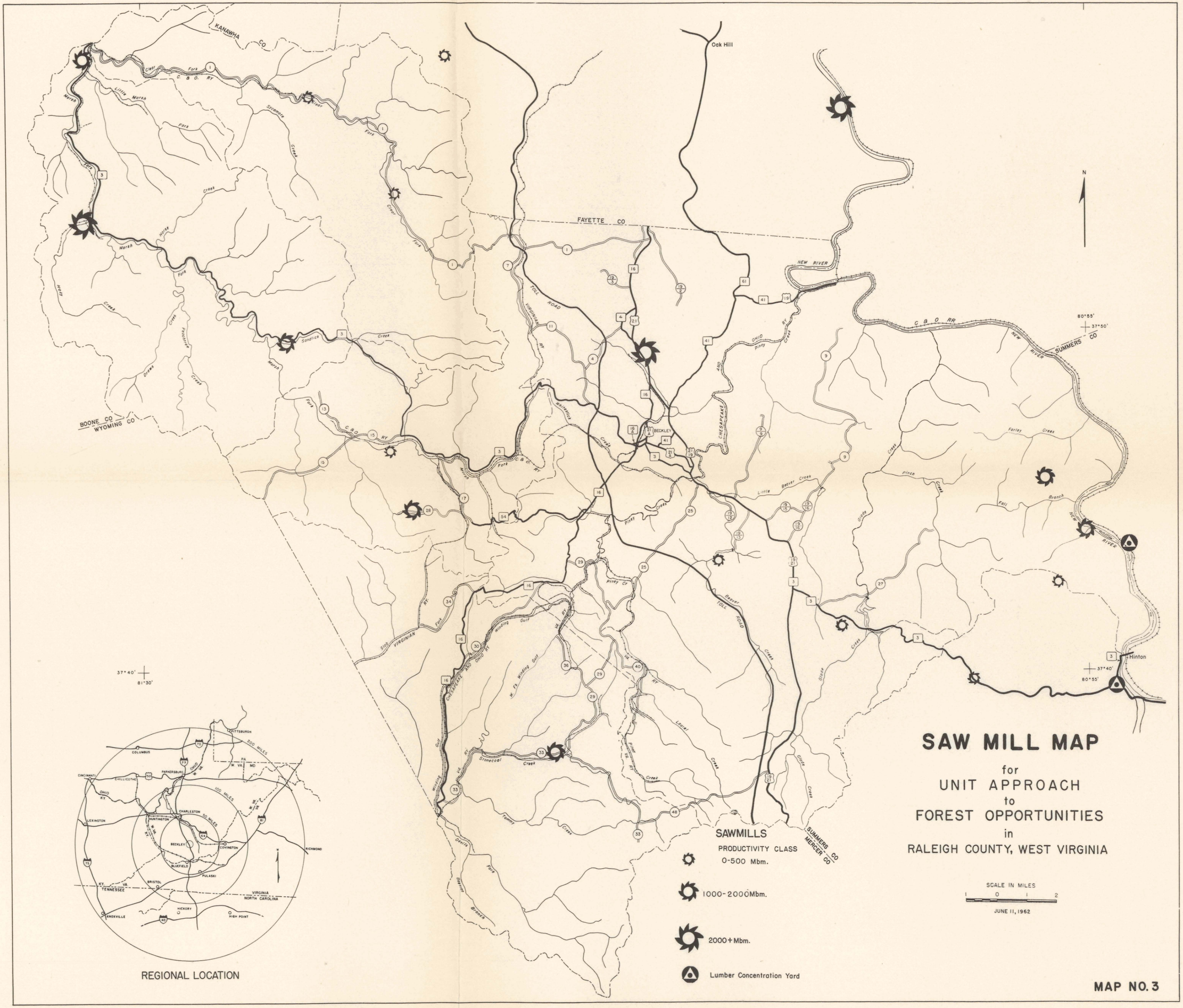
in

RALEIGH COUNTY, WEST VIRGINIA

SCALE IN MILES

1 0 1 2

MAP NO. 2



SAW MILL MAP

for

UNIT APPROACH

to

FOREST OPPORTUNITIES

in

RALEIGH COUNTY, WEST VIRGINIA

SCALE IN MILES

0 1 2

JUNE 11, 1962

37°40'
81°30'

REGIONAL LOCATION

MAP NO. 3

LEGEND

WATER DEVELOPMENT

- LAKES, Existing, under construction or authorized.
- LAKES, Potential site locations.
- LAKES, Proposed for Flood Control in the MARSH FORK WATERSHED

RECREATIONAL DEVELOPMENT

V	VISTA
H	LODGE
O	ORGANIZATION CAMP
P	PICNICKING
S	SWIMMING SITE
C	CAMPING
W	SKI AREA
R	SUMMER HOMES OR CABINS
B	BOATING SITE
-H-R-	HORSE OR HIKING TRAIL, PROPOSED

- Existing
- Proposed.
- Potential occupancy site, undifferentiated.

37°40' 81°30'

37°40' 80°55'

80°55' 37°50'

N

EXISTING AND POTENTIAL RECREATION & WATER DEVELOPMENT MAP for UNIT APPROACH to FOREST OPPORTUNITIES in RALEIGH COUNTY, WEST VIRGINIA

SCALE IN MILES

1 0 1 2

MAP NO. 4

LARGE LAND OWNERSHIP MAP

for

UNIT APPROACH

to

FOREST OPPORTUNITIES

in

RALEIGH COUNTY, WEST VIRGINIA

Owner Differentiation

SCALE IN MILES

0 1 2

80°55'
37°50'

37°40'
81°30'

37°40'
80°55'

MAP NO. 5.

911